

FIG. 1

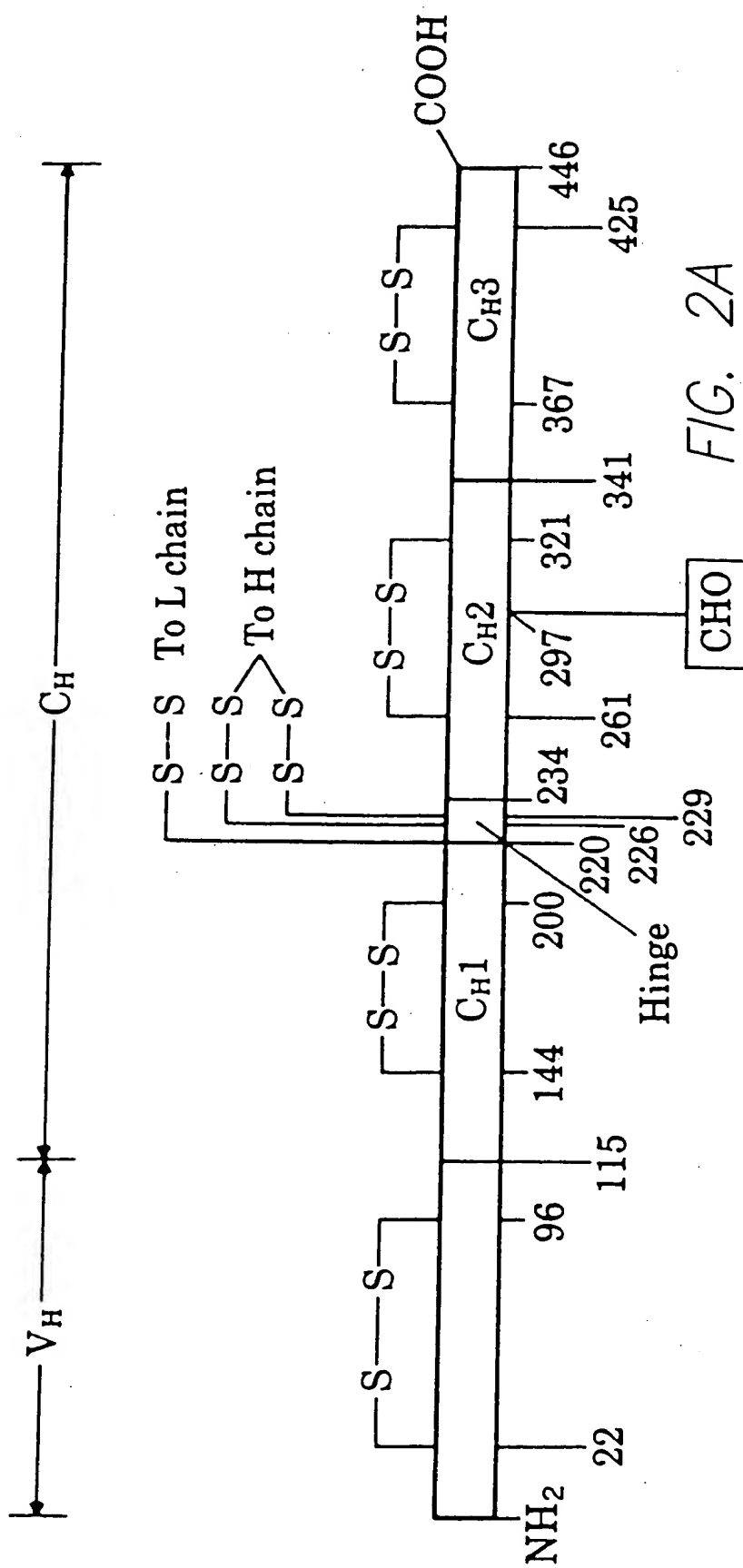


FIG. 2A

FIG. 2A-1

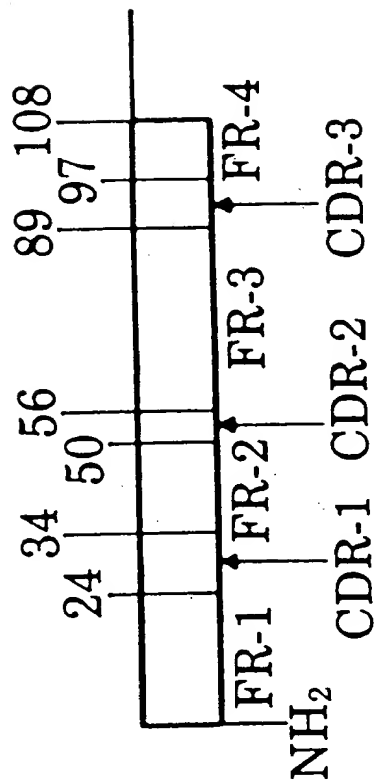
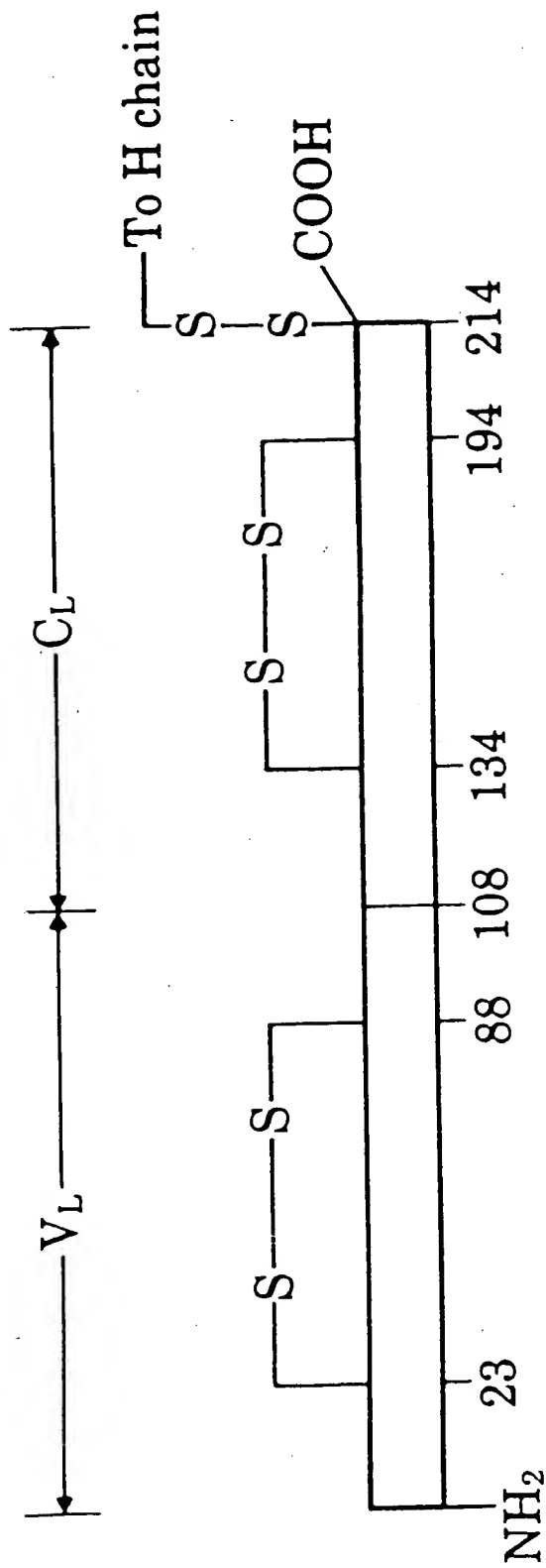


FIG. 2A-2

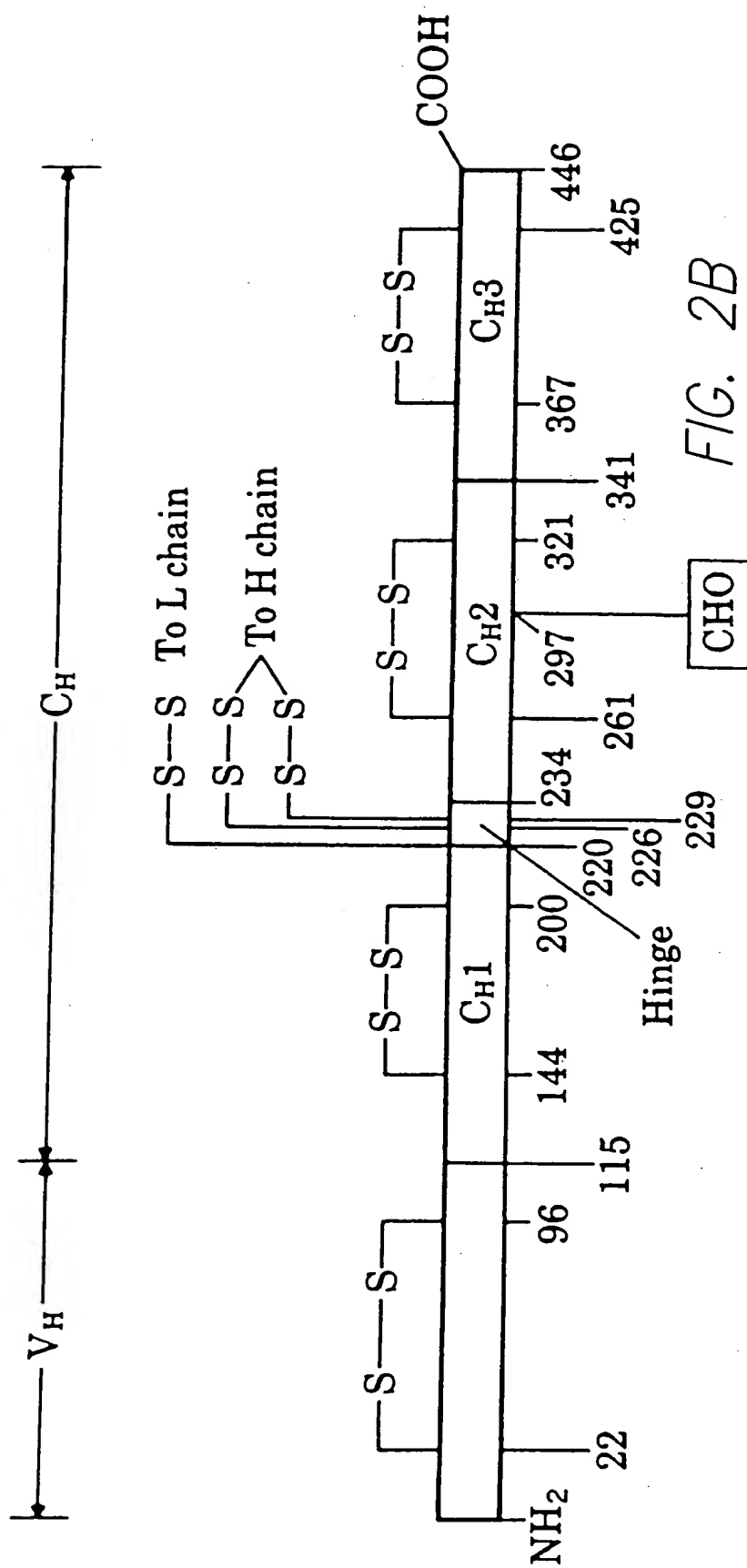
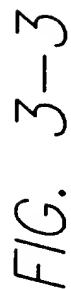


FIG. 3-1

Class	V	
	1	10
	Prototype T15 EVKLVEGGGLVQPPGGS T15	
IgM	HPCM2	+
	HPCM3	-
	HPCM1	+
	HPCM6	-
	HPCM4	-
IgG	HPCG8	+
	HPCG13	-
	HPCG14	-
	HPCG11	+
	HPCG12	+
IgA	T15	+
	S63	+
	Y5236	+
	S107	+
	H8	+
	M603	+
	W3207	-
	M511	-
	M167	-





Class

V

Year	1960	1970	1980	1990
1960	60	70	80	90

Prototype T15 DYTT EYSA SVKG RFIVSR DTSQ S ILYL QMNALRAEDTAI T15

HP CM2

HP CM3

IgM

HPSCM1

HP CM6

HPSCM4

HPCG8

HPCG13

IqG

HPCG14

HPCG11

HPCG12

T15

563

Y5236

5107

IqA

88

M603

W3207

W520
M511

6167
6168

R

ZAH

A

30

15

5

71

83
80

56

57

1



FIG. 3-4

V D J

Class
 Prototype T15
 YYCARD YYGSS YWYFDVWGAGTTVTVSS T15
 Idiotype

	100	110	120	
IgM	HPCM2			+
	HPCM3			-
	HPCM1	DYP H		+
	HPCM6	F_RYD G		-
	HPCM4			-
IgG	HPCG8	R		+
	HPCG13	A		-
	HPCG14	V YD		-
	HPCG11			+
	HPCG12			+
IgA	T15			+
	S63			+
	Y5236			+
	S107			+
	H8	N		+
	M603	N T		+
	W3207	N KYD L V		-
	M511	GD		-
	M167	T AD N YFG		-
		HV3		-

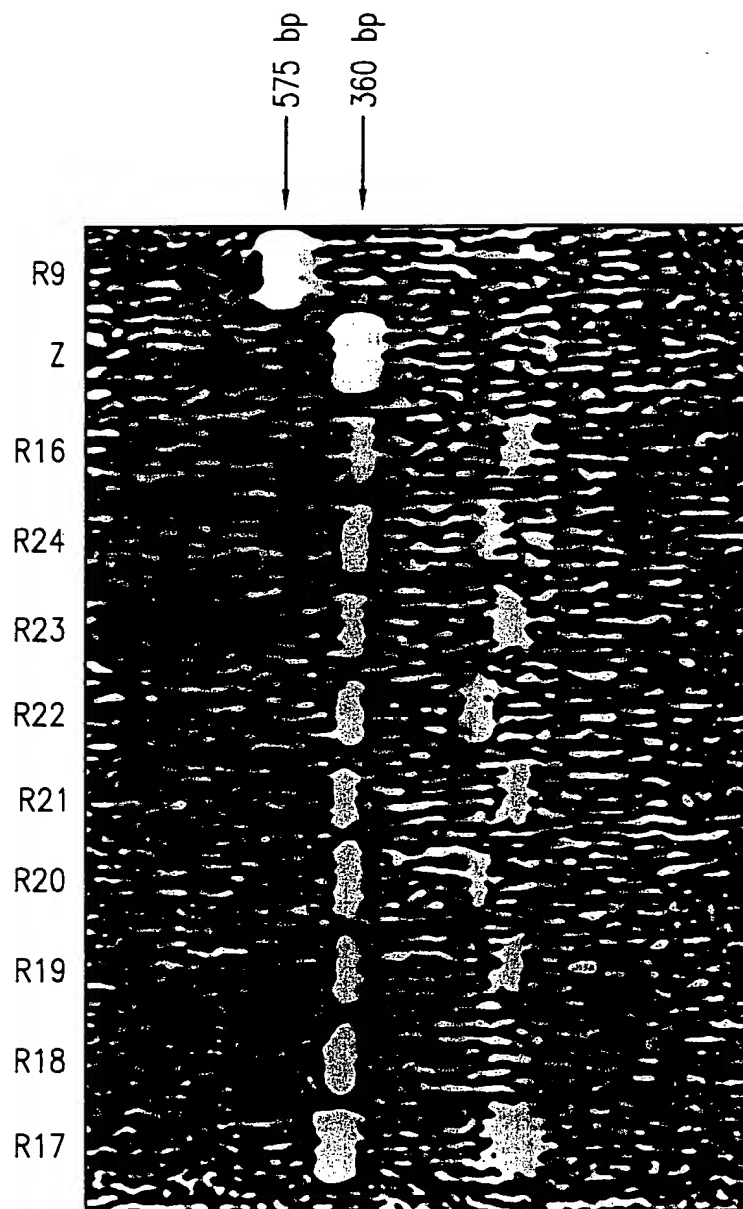


FIG. 4



FIG. 5

Subclass I (A)

#L39 CTCGAGTCAGGACCTGGCCTCGTGAAACCTTCTCAGTCCTGTCTCACCCTGCTCTGTCACTGGCTACTCCATCACCAGTGCCTATTACIGGAACTGGATCCGGCAGTT

Subclass II (A)

#L11 CTCGAGTCCTGGGCTTAACTGGCAAAACCTGGGGCTCAGTGAAGATGTCCTGCAAGGCTTCTGGCCACACCTTGACTAGTACTGGATACACTGGGTAAANAGAGGCC
#L03 CTCGAGTCCTGGACCTnAGCTGGTAAAGCCTGGGGTTTCAGTGAAGATGTCCTGCAAGGCTTCTGGATACACATTCACnAGCTATGTTATACACTGGGTGAAGCAGAAGCCT
#L32 CTCGAGTCCTGGACCTGAACCTGGGACTTCAGTGAAGATGTCCTGCAAGGCTTCTGGATACACATTCACCAGCTATGTTAIGCGCTGGGTGAAGCAGAAGGCC

Subclass II (B)

#L37 CTCGAGTCAGGGGCTGAACCTGGTGAAGCCTGGGGTTTCAGTGAAGTTCCTGCAAGGCTTCTGGCTACACCTTCACnAGCTACTATAIGTACTGGGTGAAGCAGAAGGCC
#L06 CTCGAGTCCTGGGGCTAAGCTGGTAAGGCCCTGGAGCTTnAGTnAAGCTGTCTGnAGGGCTTCTGGCTACTCCTTCACnAGCTACTGGATGAACCTGGGTGAAGCAGAAGGCC

Subclass II (C)

#L33 CTCGAGTCCTGGGGCTGAGCTGGTGAGGCCCTGGAGCTTCAGTnAAGCTGTCTGCAAGGCTCTCGTACTCCTTCACCAGCTCCIGATAACTGGGTGAAGCAGAAGGCCCTGG

Subclass III (B)

#L36 CTCGAGTCAGGAGGTGGCCTGGTGAGCCTGGAGGATCCCTGAAACTCTCCTGTGCAGCCTCAGGATTCGATTTnAGnAGATACTGGATGAATGGGTCCGGCAGCTCCA
#L02 CTCGAGTCCTGGAGGTGGCCTGGTGAGCCTGGAGGATCCCTGAACTCTCCCTGTGCAGCCTCAGGATTCGATTTnAGnAGATAAATGGATGAGTTGGGTCCGGCAGGCTCC
#L31 CTCGAGTCCTGGAGGTGGCCTGGTGAGCCTGGAGGATCCCTGAAAGTCTCCTGTGCAGCCTCAGGATTCGATTTnAGnAGATACTGGATGAGTTGGGTCCGGCAGCTCCA
#L34 CTCGAGTCCTGGAGGTGGCCTGGTGAGCCTGGAGGATCCCTCAAACTCTCCTGTGCAGCCTCAGGATTCGATTTnAGnAGATACTGGATGAGTTGGGTCCGGCAGCTCCA
#L50 CTCGAGTCAGGAGGTGGCCTGGTGAGCCTGGAGGAGGCCCTGAAACTCTCCTGTGCAGCCTCAGGATTCGATTTnAGnAGATACTGGATGAGTTGGGTCCGGCAGCTCCA

Subclass III (C)

#L10 CTCGAGTCCTGGGGAGGCTTAGTnCAGCCTGGAGGGTCCCGGAAACTCTCCTGTGCAGCCTCTGGATTCACCTTTnAGnAGTTTTGGAAATGCACCTGGATTCGTACGGCTCC
#L08 CTCGAGTCCTGGGGAGGCTTAGTnAGCCTGGAGGGTCCCGGAAACTCTCCTGTGCAGCCTCTGGATTCACCTTTnAGnAGCTTTTGGAAATGCACCTGGGTACGTACGGCTC

Subclass V (A)

#L38 CTCGAGTCAGGGGCTGAACCTGGTGAGGCCCTGGGCGTTTCAGTnAAGATGTCTGCAAGGCTTCAGGCTATTCTCTCACCAGCTACTGGATGCACCTGGGTGAACACAGAGGCC

Miscellaneous

#47 CTCGAGTCAGGGGCTGAACCTGGCAAAACCTGGGGCTCAGTAAAGATGTCTGCAAGGCTTCTGGCTACACCTCTCTTCTCTTCTGGCTGCACCTGGATAAAGAGGCCCT
#L35 CTCGAGTCCTGGACCTnAGCTGGTGAAGCCTGGGGTTTCAGTTAAATAATCCTGCAAGGCTTCTGGTTACTCATTTTCTnTCTACTTTTGTGAACCTGGGTGATGCAGAGCCAT
#L48 CTCGAGTCAGGGGCTGAACCTGGTGAAGCCTGGGGTTTCAGTAAGTGTCTGCAAGGCTTCTGGCTACACCTTCACCGGCTACTATATGTACTGGGTGAAGCAGAAGGCCCTGG



FIG. 6A-1

V_H EXPRESSION VECTOR:

SHINE-DALGARNO MET

GGCCGCAAATTCTATTTCAAGGAGACAGTCATAATG
CGTTTAAGATAAAGTTCCTCTGTCAGTATTAC

LEADER SEQUENCE

AAATACCTATTGCCTACGGCAGCCGCT
TTTATGGATAACGGATGCCGTCGGCGA

LEADER SEQUENCE

GGATTGTTATTACTCGCTGCCCAACCAG
CCTAACAATAATGAGCGACGGGTTGGTC

FIG. 6A-2

LINKER

LINKER

NCOI	V _H BACKBONE	XHOI	SPEI
------	-------------------------	------	------

CCATGGCCCAGGTGAAACTGCTCGAGATTTCTAGACTAGT
GGTACCGGGTCCACTTTGACGAGCTCTAAAGATCTGATCA

TyrProTyrAspValProAspTyrAlaSer STOP LINKER
TACCCGTACGACGTTCCGGACTACGGTTCTTAATAGAATTCTG
ATGGGCATGCTGCAAGGCCTGATGCCAAGAATTATCTTAAGCAGCT



FIG. 6B-1

V_L EXPRESSION VECTOR:

SHINE-DALGARNO

GGCCGCAAATTCTATTTCAAGGAGACAGTCATA
CGTTTAAGATAAAGTTCCTCTGTCAGTAT

MET

LEADER SEQUENCE

ATGAAATACCTATTGCCTACGGCAGCCGCTGGA
TACTTTATGGATAACGGATGCCGTCGGCGACCT

LEADER SEQUENCE

TTGTTATTACTCGCTGCCCAACCAG
ACAATAATGAGCGACGGGTTGGTC

FIG. 6B-2

LINKER

NCOI	V _H BACKBONE
CCATGGCCCAGGTGAAACTG	
GGTACCGGGTCCACTTTGAC	

LINKER

XHOI	SPEI	STOP
CTCGAGAATTCTAGACTAGTTAATAG		
GAGCTCTTAAGATCTGATCAATTATCAGCT		



FIG. 7

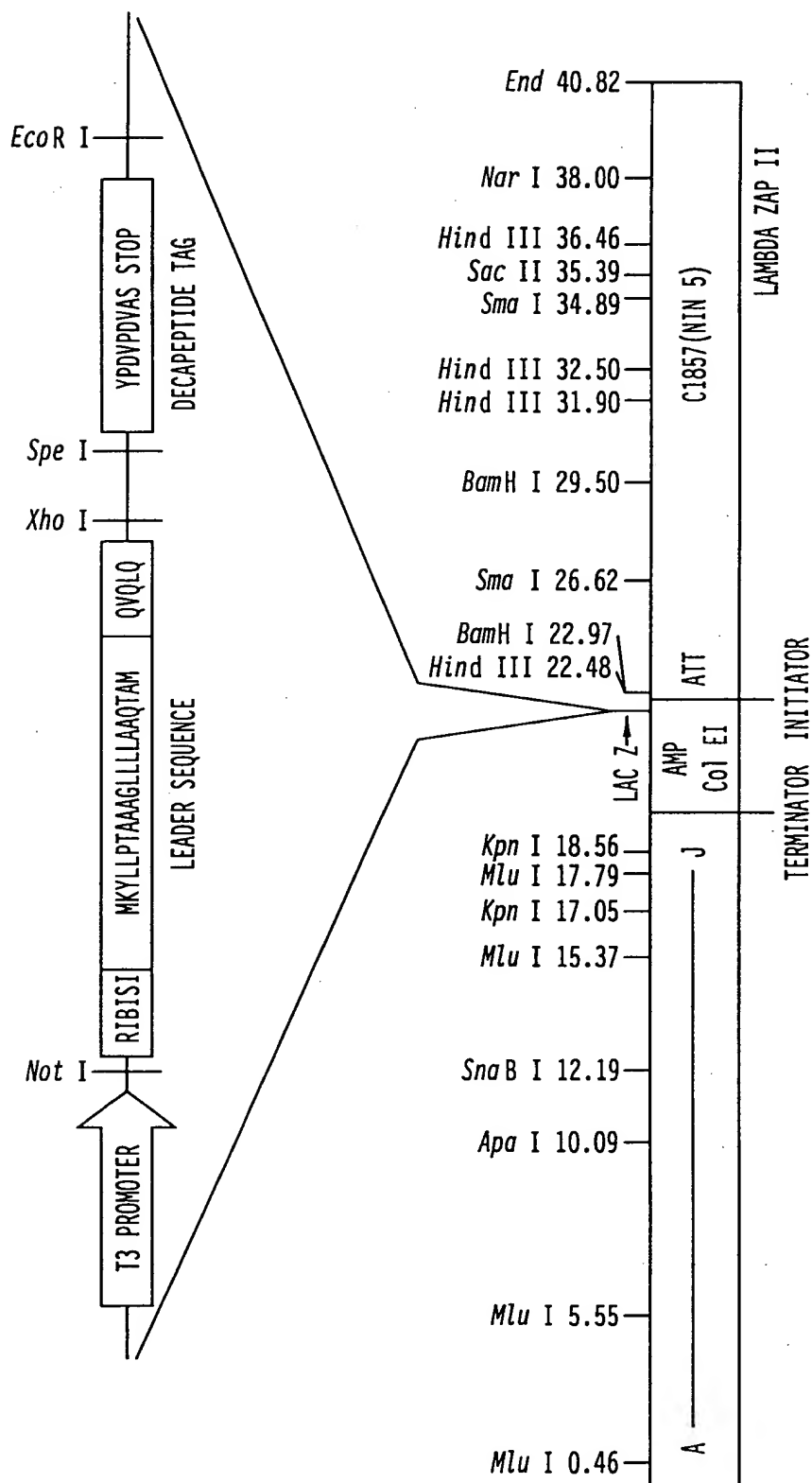




FIG. 8

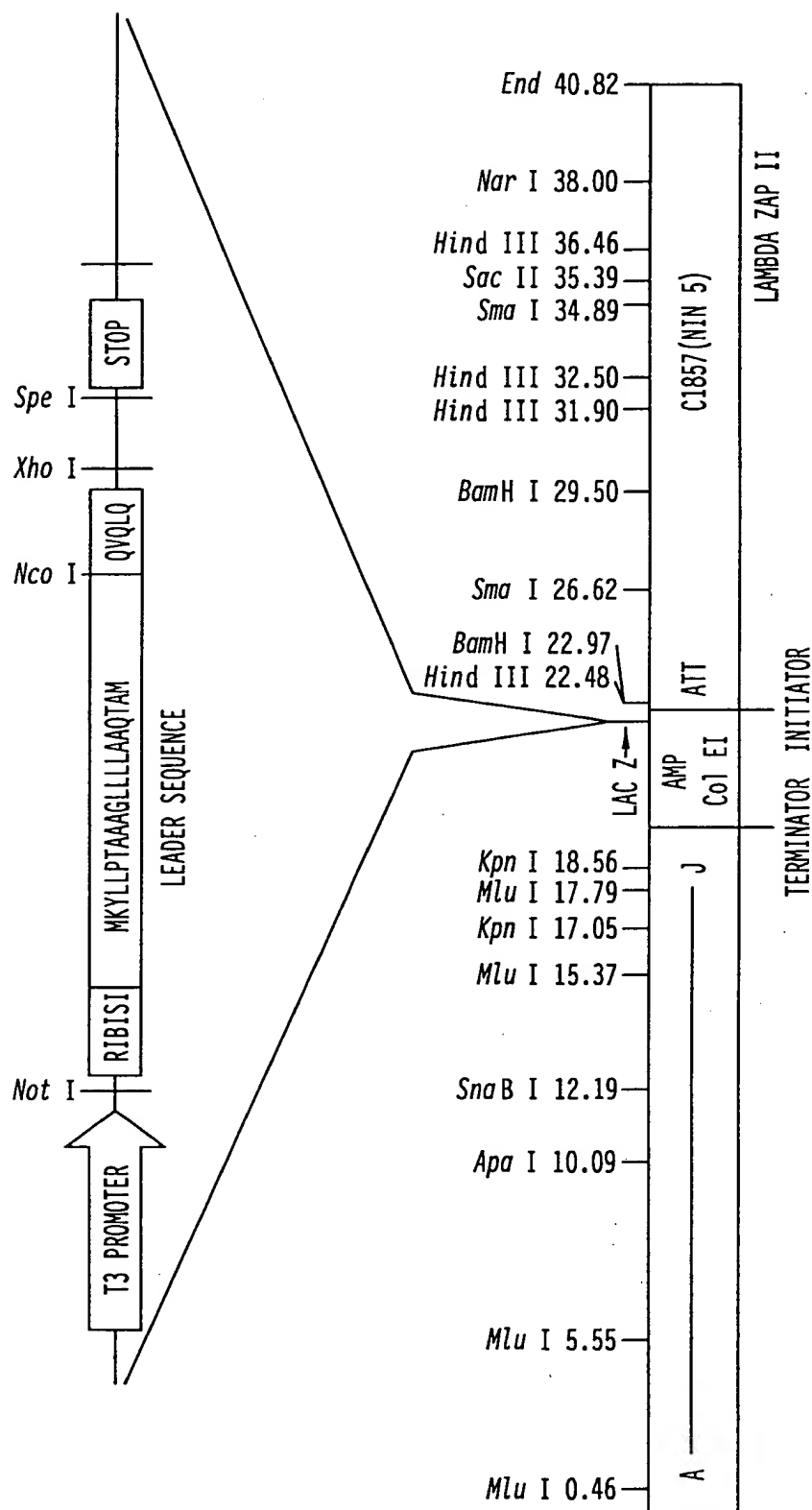




FIG. 9

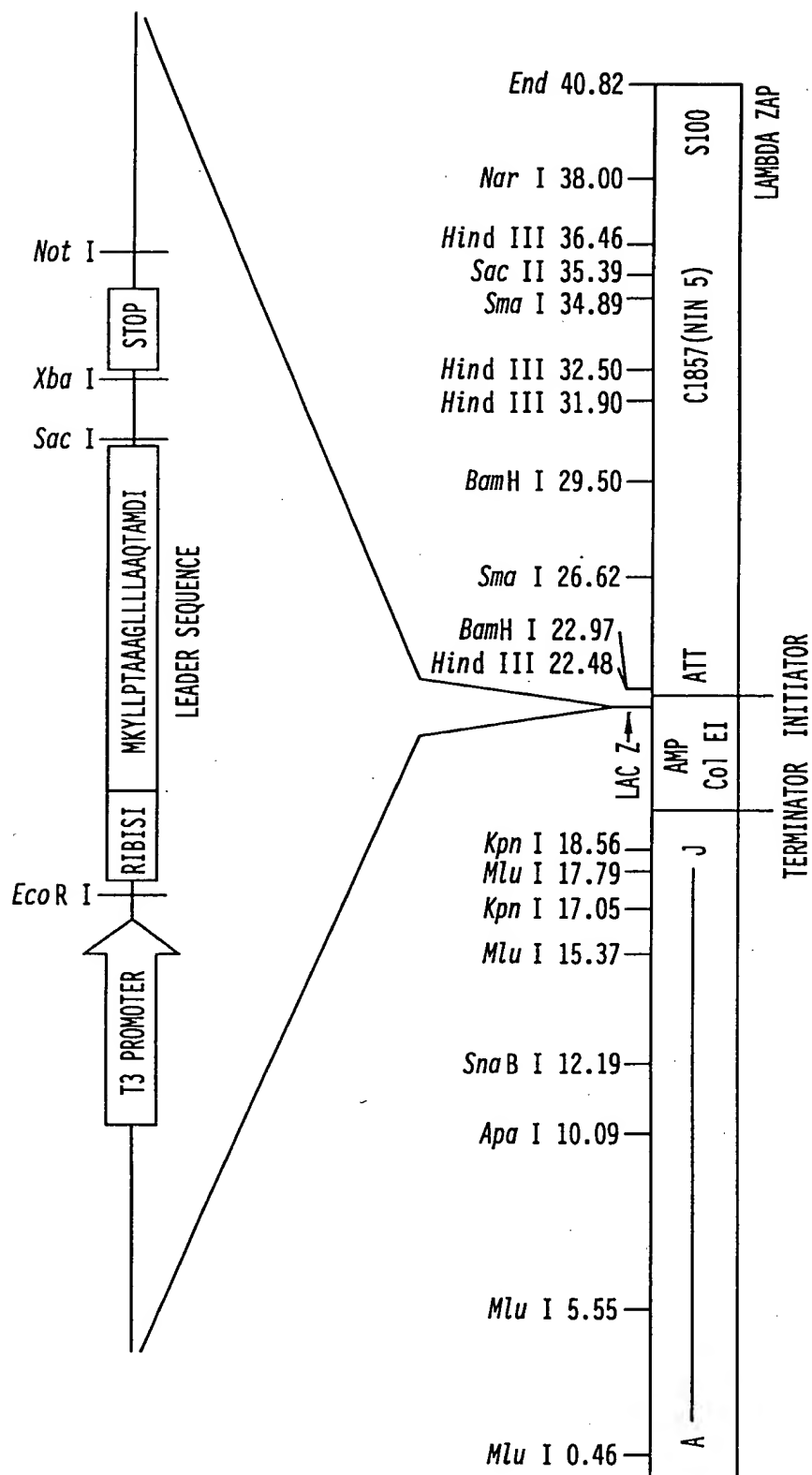




FIG. 10

ECOR I	SHINE-DALGARNO	MET
<u>TGAATTC</u> TAAACTAGTCGCCAAGGAGACAGTCATAATGAAT		
TCGAACTTAAGATTGATCAGCGGTTCCCTCTGTCAGTATTACTTTA		

LEADER SEQUENCE

ACCTATTGCCCTACGGCAGCCGCTGGATTGTTATTACTCGCTGCCCAACCAG
TGGATAACGGATGCCGTCGGCGACCTAACAAATAATGAGCGACGGTTGGTC

NCO I	SAC I	XBA I	Not I
<u>CCATGGCCGAGCTCGTCAGT</u> TCTAGAGTTAAGCGGCCG			
GGTACCGGCTCGAGCAGTCAAGATCTCAATTCCCGGCAGCT			

FIG. 11-1

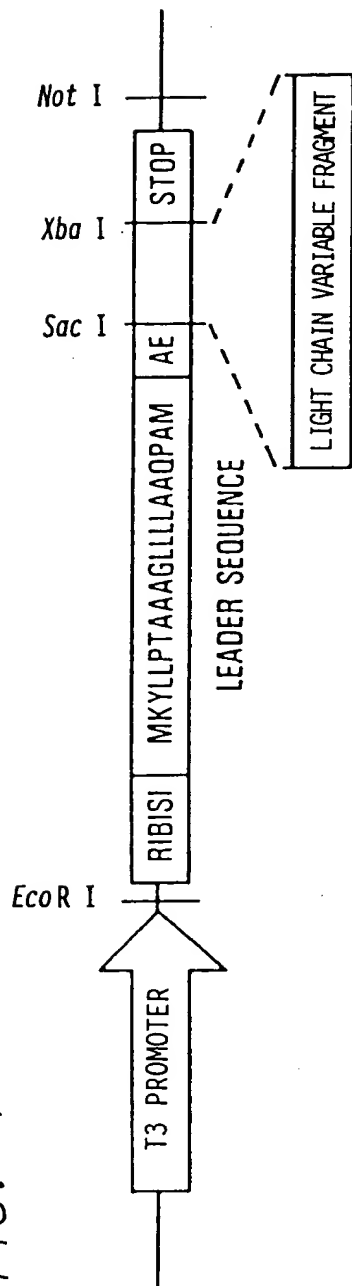
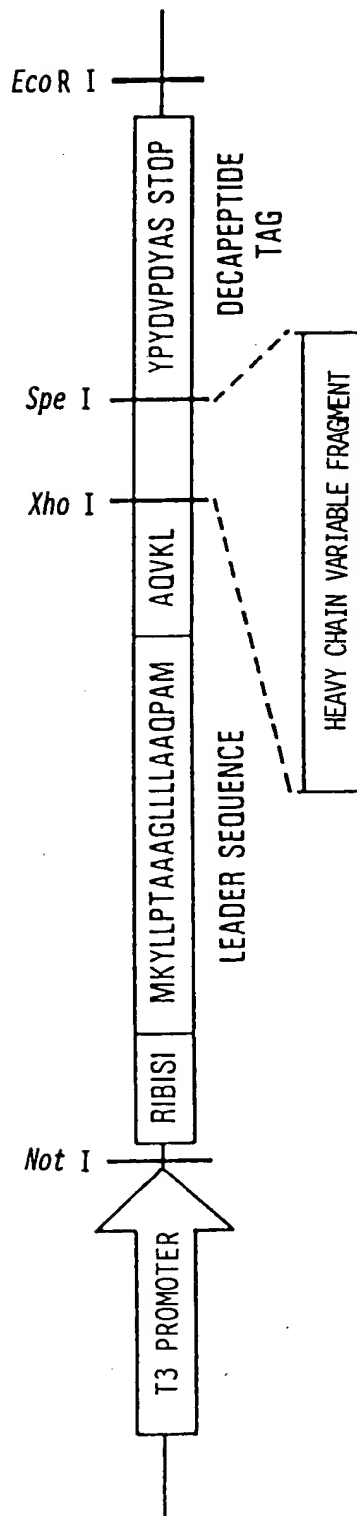
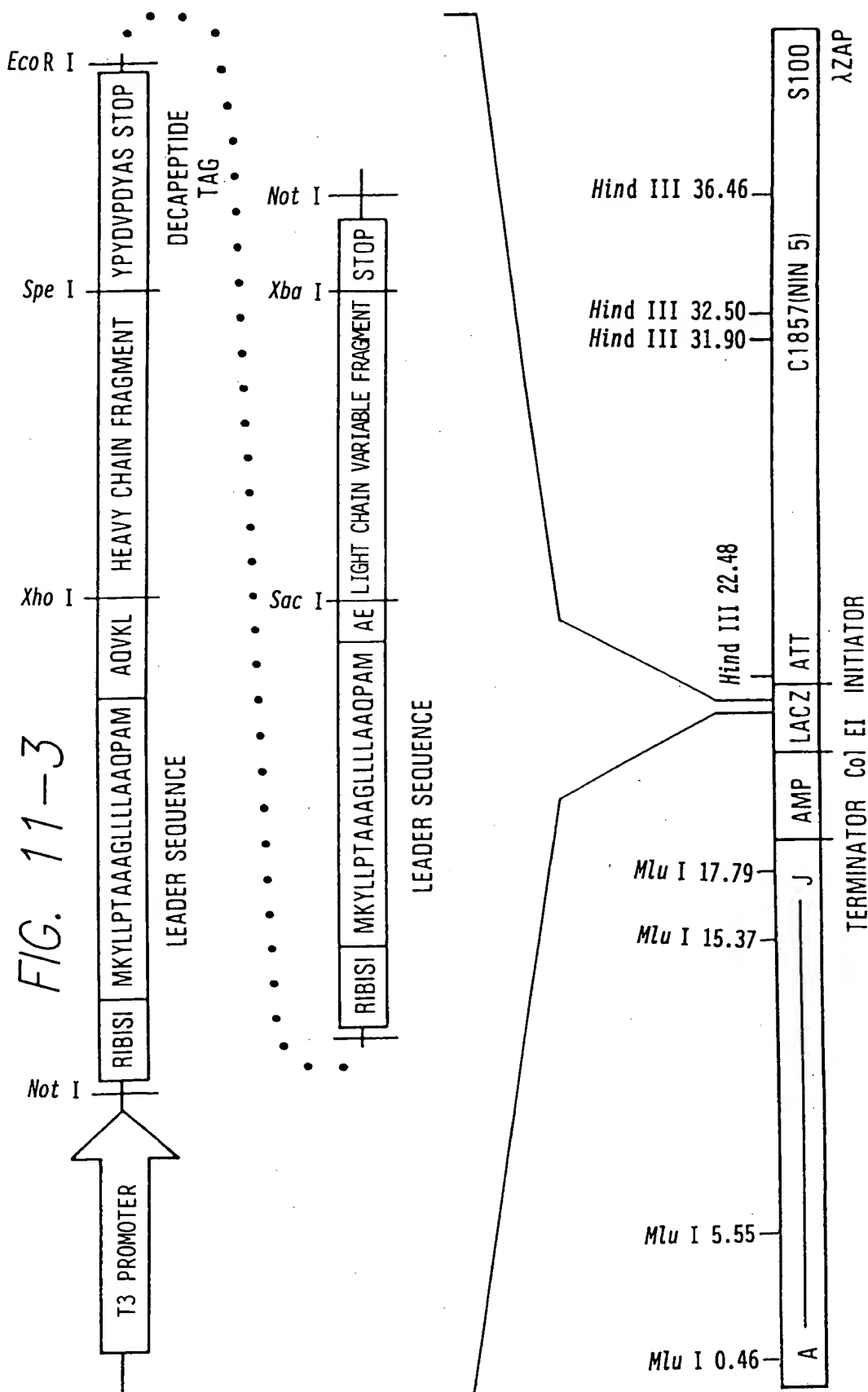


FIG. 11-2





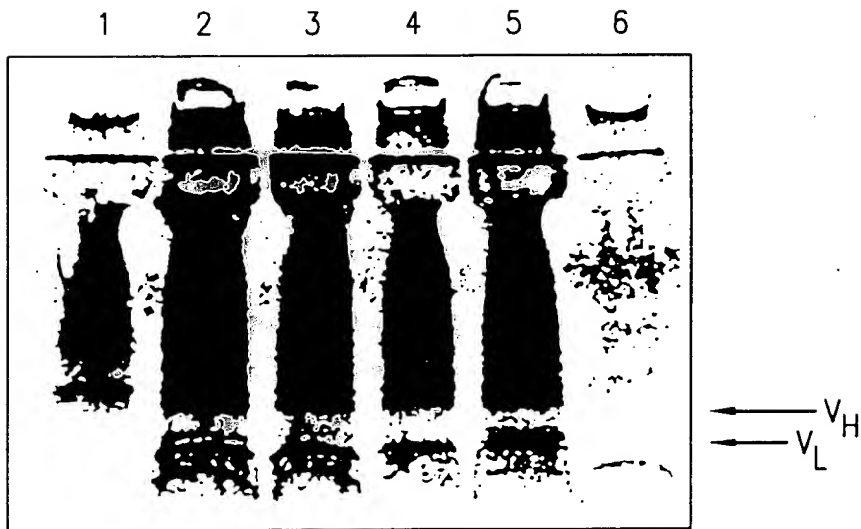
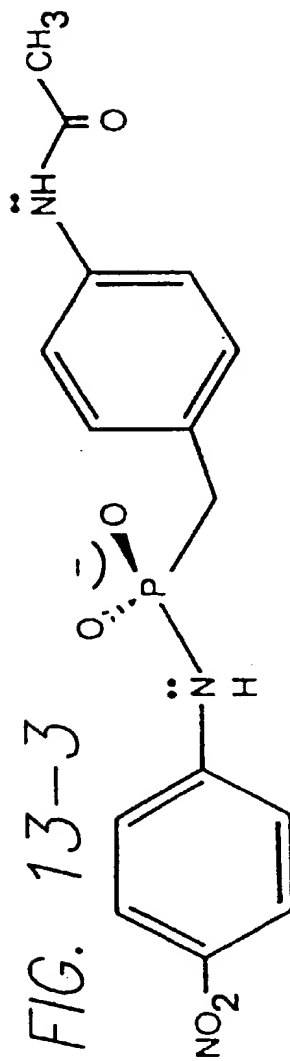
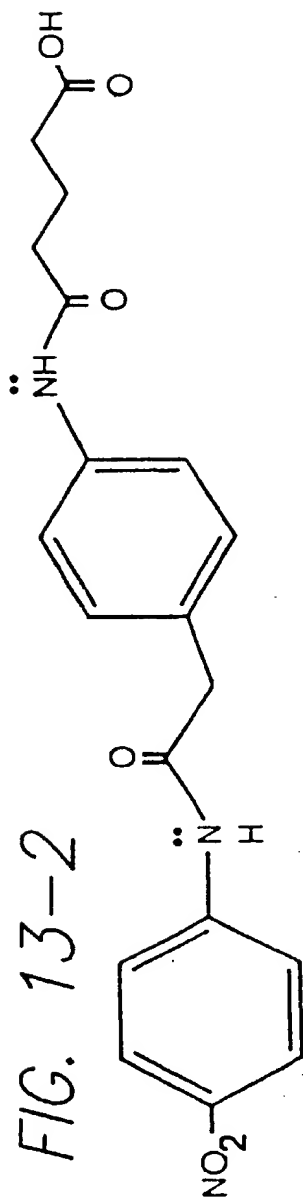
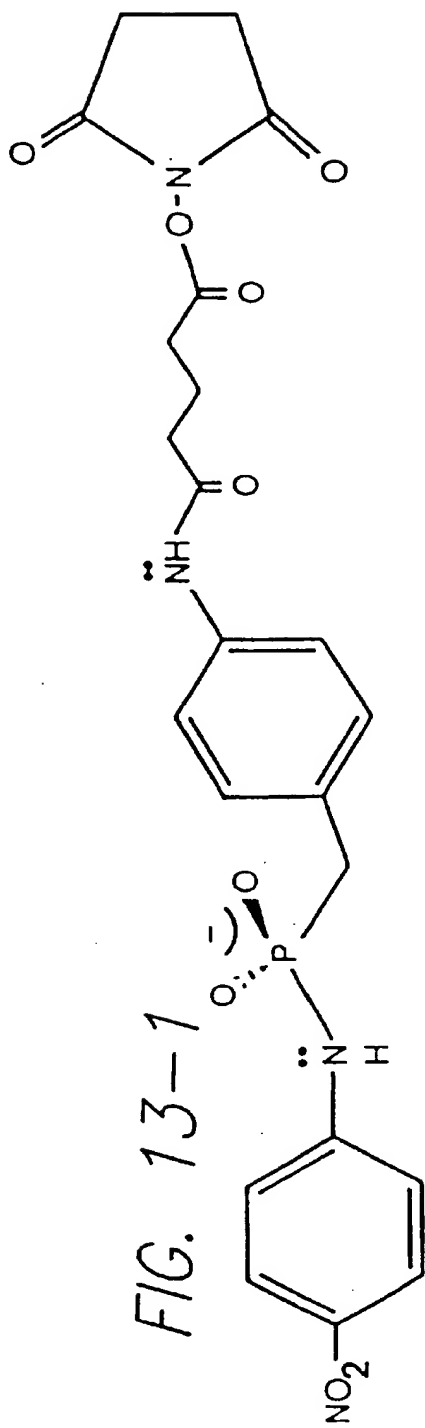


FIG. 12



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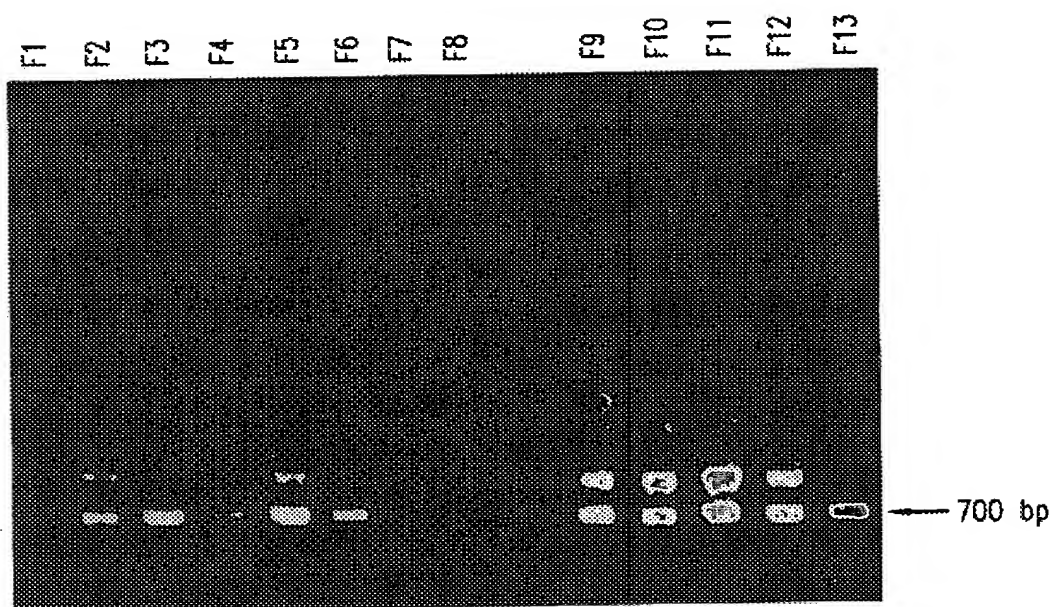
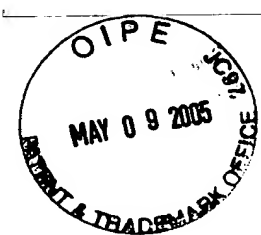


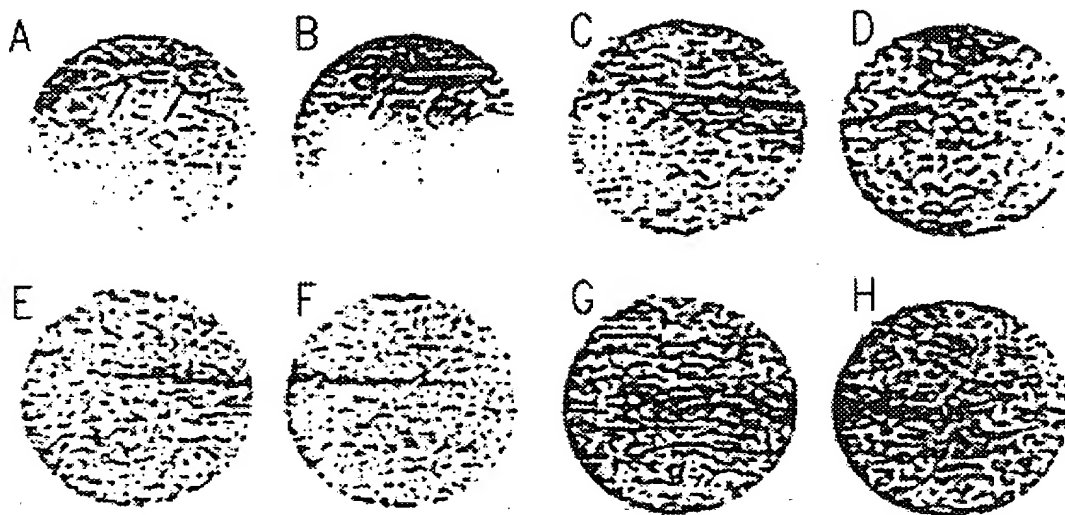
FIG. 14

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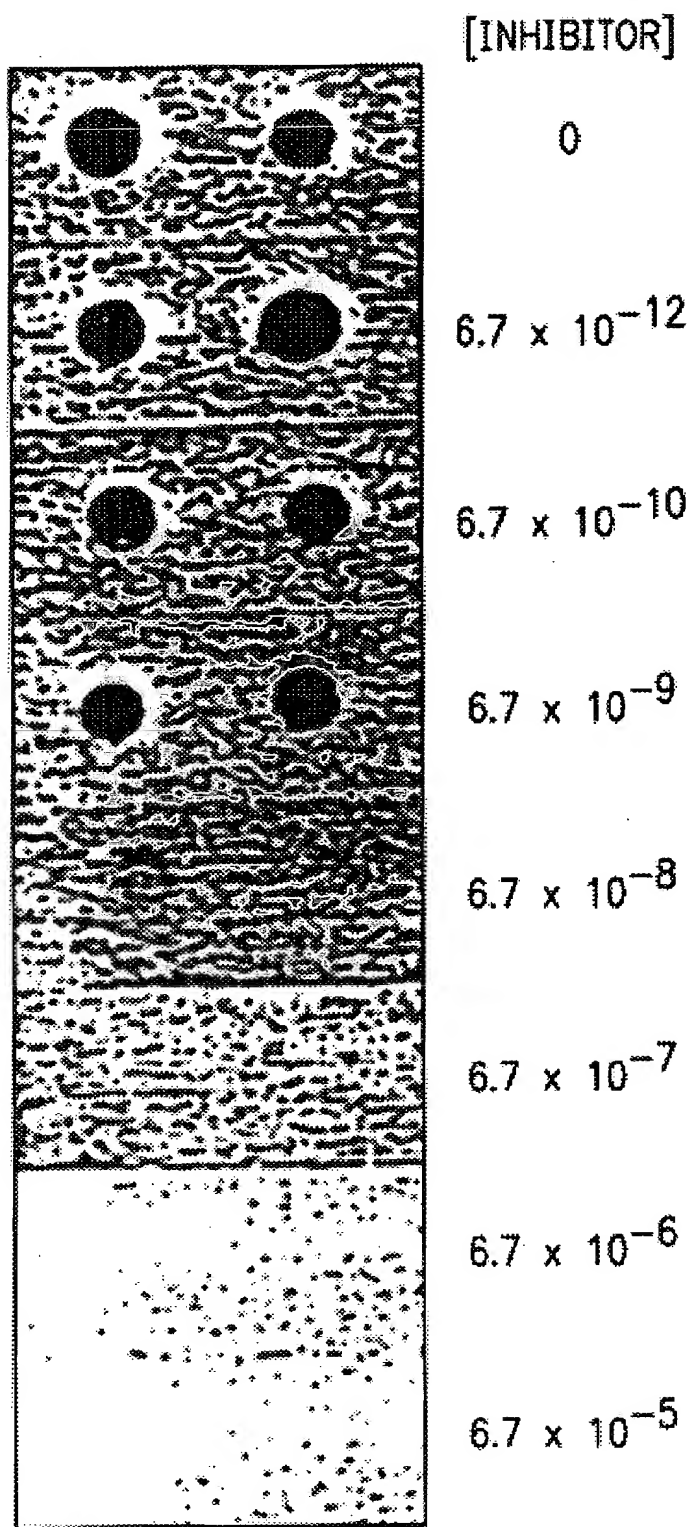
FIG. 15





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FIG. 16



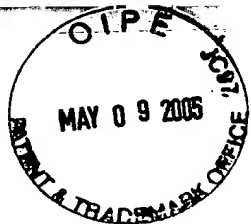


FIG. 17

